

### **Abstract of the Disclosure**

An efficient technique for producing deterministically polarized single photons uses liquid-crystal hosts of either monomeric or oligomeric/polymeric form to preferentially align the single emitters for maximum excitation efficiency. Deterministic molecular alignment also  
5 provides deterministically polarized output photons; using planar-aligned cholesteric liquid crystal hosts as 1-D photonic-band-gap microcavities tunable to the emitter fluorescence band to increase source efficiency, using liquid crystal technology to prevent emitter bleaching. Emitters comprise soluble dyes, inorganic nanocrystals or trivalent rare-earth chelates.